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Case Report

An investigation of the resurgence of yellow fever outbreak in Kwara State, Nigeria, 2018

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ABSTRACT

The frequent occurrence of yellow fever (YF) outbreaks in Nigeria affirms that YF is a re-emerging public health threat. This case report therefore aimed to provide a description of a confirmed case of in Ifelodun Local Government Area of Kwara State between January and December 2018. We conducted an outbreak investigation of YF in Kwara state, Nigeria. On 18th December 2018, a 25-year-old man (Mr. A) suspected for YF was reported from Agunjin ward of Ifelodun LGA in Kwara State. Mr. A presented with a history of fever and jaundice. Laboratory investigations were conducted, and Mr. A was confirmed positive to YF Immunoglobin M from the regional World Health Organization laboratory in Dakar, Senegal, but survived the YF illness. Community survey revealed nearly 53% YF vaccination coverage using both card and history. The rapid response team in Kwara State paid courtesy visits to the palace of the Alagunjin of Agunjin who assured of the community's cooperation. Active case search was encouraged for all healthcare workers who participated in the vaccination activity, and on-the-job trainings were conducted. To ensure 100% YF vaccine coverage in Agunjin and neighboring settlements, a mop-up vaccination program, was conducted, and all persons who received the vaccine were each issued a yellow card. To forestall a recurrence of YF outbreaks, increasing YF vaccination coverage in community settings should be promoted. Increased commitment of the government at all levels towards improving YF surveillance and providing logistics support should be prioritized.

Keywords: Yellow fever, Yellow fever outbreak, Public health, Health emergencies, Nigeria

INTRODUCTION

Yellow fever (YF) is a viral hemorrhagic fever transmitted primarily to reservoirs including humans and lower primates from mosquitoes.[1] The YF vector in America is the haemagogus spp, while the Aedes spp is the YF vector in Africa.[2] The symptoms of YF vary from mild illness with flu-like symptoms to severe illness such as fever (>38°C), abdominal pain, jaundice, vomiting, and bleeding.[3] Among individuals with severe symptoms, the mortality rate has been estimated at 50%.[4] Despite the availability of a life-long potent vaccine, YF poses a significant health threat to the African continent with nearly 51,000 to 380,000 severe cases recorded annually.[4] Many outbreaks of YF have been linked to rapid urbanization. Angola and the Democratic Republic of Congo experienced urban outbreaks of YF between 2015 and 2016.[5]

Rapid urbanization is one of the emerging issues in population transition associated with population migration, and climate change.[5] As a result of these processes, increased transmission of YF and high densities of mosquito vectors have been ushered in due to a higher proportion of individuals who have not received the YF vaccine.[6] Nigeria has the highest burden of YF primarily

due to her large population size, high vulnerability to infections, and the low rate of vaccination uptake.[6] The prevention and control of YF depends on early case detection and strong surveillance systems, health system resilience, reactive and preventive YF vector control campaigns, and routine immunization activities.[5] Routine immunization activities are organized for children below 1 year to prevent theoccurrence of YF among them.

Nigeria has experienced several outbreaks of YF since the index case was reported in Lagos State in 1864. Several outbreaks of YF have also been reported in Lagos State between 1864 and 1926.[7] In 1969, however, a major YF outbreak occurred in Jos, Plateau State, with more than 100,000 people infected.

Between 1987 and 1996, nearly 120,000 individuals have been infected with YF in Cross river, Benue, Plateau, and Oyo States.[8] Between 1996 and 2016 however, Nigeria did not report any confirmed case of YF. Thus, plans were ongoing by the World Health Organization (WHO) to declare that YF had been eliminated in Nigeria.

After 21 years of recording no confirmed case of YF in Nigeria, a case of YF was detected in Ifelodun Local Government Area of Kwara State in 2017.[1] The case was a seven-year-old member of the nomadic Fulani population, known for low YF vaccination coverage, who presented with fever and discoloration of the eyes. Immediately after the case notification, the Rapid response team (RRT) of the Nigeria Centre for Disease Control swinged into action based on the following objectives. Firstly, to conduct YF vaccination campaigns for children below 10 years, evaluate immunization records of children within this age range, and support the state surveillance team to conduct surveillance activities. In addition, support for risk communication and social mobilization activities were provided by the RRT.[1]

The emergence of YF outbreaks in Nigeria therefore affirms reports from other countries on the African continent that YF is a re-emerging public health threat. Gaps and challenges in surveillance therefore need to be addressed to forestall the re-emergence of the YF outbreak in Nigeria. The aim of the case report was to provide a description of a confirmed case of YF in Ifelodun Local Government Area of Kwara State between January and December 2018.

CASE REPORT

On 18th December 2018, a 25-year-old man (Mr. A) suspected for YF was reported from Agunjin ward of Ifelodun LGA in Kwara State. Mr. A presented with a history of fever and jaundice. At first, Mr. A's immunization status could not be ascertained as he had travelled earlier to his hometown. However, information obtained from his friends revealed that Mr. A was absent in Agunjin in October 2017 when the reactive YF vaccination campaign was conducted in Ifelodun LGA. During his trip, Mr. A travelled to Kebbi State (Sanganga village, Sakaba LGA, Kebbi State) to seek non-orthodox treatment. But as of the time of this investigation, he had returned to Agunjin from his trip.

Laboratory investigations were conducted, and Mr. A was confirmed positive to YF IgM from the regional WHO laboratory in Dakar, Senegal, but survived the YF illness. Community survey was conducted in Agunjin, and this revealed about 53% YF vaccination coverage using both card and history. The average proportion obtained could have been due to the absence of many community members at the time of the vaccination campaign in 2017. Few others who had not been vaccinated in previous locations had recently relocated into the community for farming and trading purposes.

The routine immunization coverage for children below 1 year old was 139,281, while that of Ifelodun LGA was 12,103 between January and December 2018. Of the 383 public health facilities in Kwara State, 80 were in Ifelodun LGA, while among 127 private health facilities, 14 were in Ifelodun LGA, with only 43 public health facilities providing rapid immunization services.

Between January and December 2019, the coverage of pentavalent was 99% in Kwara State, and 74% in Ifelodun LGA, measles vaccine coverage was 95% in Kwara State and 70% in Ifelodun LGA, while YF vaccine coverage was 95% in Kwara State and 70% in Ifelodun LGA. A total of 4,123 children below in Ifelodun LGA had not received the YF vaccine compared to the total 20,100 children who had not received the YF vaccine in Kwara State. Overall, 75% of LGAs in Kwara State had investigated at least 1 YF case with blood specimen, with 100% blood sample collected among suspected YF cases between the reference period.

The RRT in Kwara State paid courtesy visits to the palace of the Alagunjin of Agunjin who assured of the community's cooperation. The team thereafter proceeded to the Model Primary Health Centre in Agunjin where YF vaccines and information education and communication materials were kept.

The workplan for the previously conducted vaccination activities was obtained. From the workplan, it was revealed that some eligible settlements, including Agunjin, were not covered. To ensure 100% YF coverage in Agunjin and neighboring settlements, a mop-up vaccination program, was conducted, and all persons who received the vaccine were each issued a yellow card.

All participants were educated on the importance of YF vaccine and other vaccines. Active case search was encouraged for all healthcare workers who participated in the vaccination activity, and on-the-job trainings were conducted.

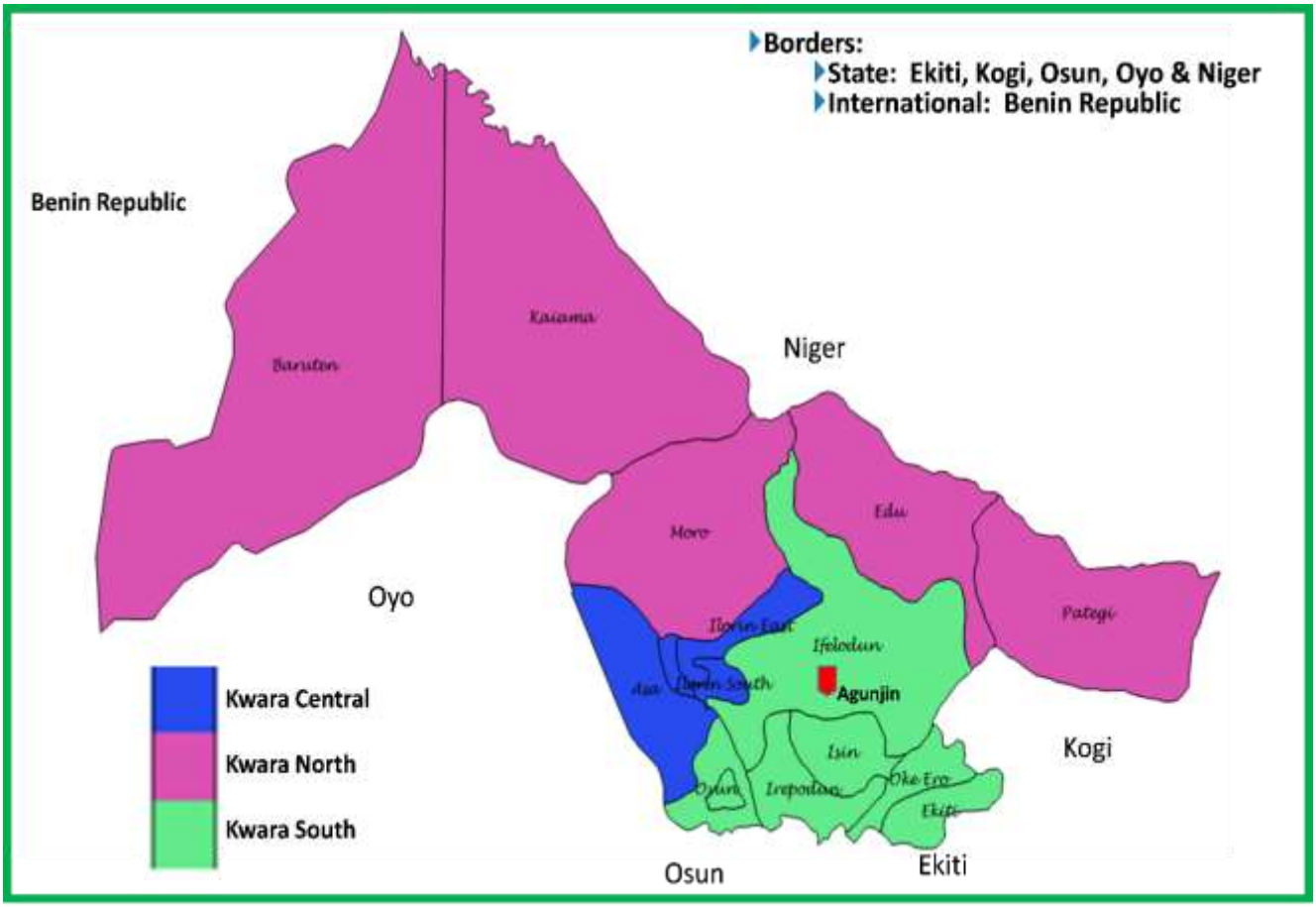

Figure 1: Boundaries of Kwara state showing the location of Agunjin in Ifelodun Local Government area.

DISCUSSION

To reduce future events of YF outbreaks in Ifelodun LGA and other parts of Nigeria, a scale-up of YF vaccination coverage is pertinent. Vaccination has been identified as a primary method for preventing the transmission of infectious illnesses. The commencement of the mass vaccination campaign contributed to a decline in the YF cases in Ethiopia.[3] In the YF context, ensuring total vaccination coverage is important to preventing the occurrence of YF, and breaking its chain of transmission.[9] To ensure that individuals who missed the vaccination activity schedule are adequately captured in the vaccination exercise, a hit-and-run vaccination program would be required.

To estimate the proportion of individuals who were missed in the vaccination activity, strengthened surveillance and case necessities should be overseen and implemented by healthcare professionals in YF-endemic communities. Public awareness programs on the risk factors and symptoms of YF need to be organized for community members regularly in tandem with the criteria for YF definition. Adequate community engagement promotes the adoption of YF preventive and control practices such as destruction of breeding sites of mosquitoes and enhances the notification of health workers when suspected cases of YF are identified.[10,11]

The government is the custodian of healthcare in any country. In Nigeria, the government is organized into three tiers, namely national, state, and LGA.[12] The Primary Health Care Development Agency (PHCDA) at the LGA level is responsible for mobilizing the LGA RRT to the YF-endemic area in a prompt fashion once notification is done by community members. The PHCDA is responsible to the State Ministry of Health and provides progressive reports and updates on the YF situation in the state. Findings from the present YF investigation revealed that the work plan provided concrete evidence on the communities that were yet to be covered in the YF vaccination campaigns. This finding therefore highlights the need for the development of a good workplan and updates as the YF vaccination campaign progresses.

To enable micro-planning for subsequent YF outbreak-targeted responses, investigation of case reports once the State Ministry of Health is notified of a suspected outbreak of YF. In lieu of this, more logistics support will be required, and strategies to strengthen routine immunization through the provision of funds for immunization outreaches are pertinent. Overall, advocacy to the national government and donor organizations should be done through the State Ministry of Health to ensure that funds are regularly available to provide immunization services.

CONCLUSION

We reported the re-emergence of YF in Ifelodun LGA, Kwara State between January and December 2018. Sub-optimal YF vaccine coverage in Ifelodun LGA could have contributed to the new cases of YF. To forestall a recurrence of YF outbreaks, increasing YF vaccination coverage should be considered. For this cause, willingness to receive the YF vaccine among community members should be promoted. Community members and healthcare workers should be trained to promptly identify suspected cases of YF and report such to the PHCDA. Likewise, timely reports should be provided by the community stakeholders to the PHCDA at the LGA on the proportion of individuals who were missed during the immediate past YF vaccination campaign. Increased commitment of the national and state governments towards improving YF surveillance and providing logistics support should be prioritized.

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REFERENCES

1. Nwachukwu WE, Yusuff H, Nwangwu U, Okon A, Ogunniyi A, Imuetinyan CJ, et al. The response to re-emergence of yellow fever in Nigeria, 2017. Int J Infect Dis. 2020;92:189-96.
2. Monath TP, Vasconcelos PF. Yellow fever. J Clin Virol. 2015;64:160-73.
3. Mulchandani R, Massebo F, Bocho F, Jeffries CL, Walker T, Messenger LA. A community-level investigation following a yellow fever virus outbreak in South Omo Zone, South-West Ethiopia. Peer J. 2019;7:6466.
4. Garske T, Van KMD, Yactayo S, Ronveaux O, Lewis RF, Staples JE, et al. Yellow Fever in Africa: estimating the burden of disease and impact of mass vaccination from outbreak and serological data. PLoS Med. 2014;11(5):1001638.
5. Pan American Health Organization. Epidemiological Update Yellow Fever, 2018. Available at: https://www.paho.org/hq/index.php?option=com_topics&view=rdmore&cid=2194&Itemid=40784&lang=en. Accessed on 18 March 2021.
6. Agwu EJ, Igbinosa IB, Isaac C. Entomological assessment of yellow fever-epidemic risk indices in Benue State, Nigeria, 2010-2011. Acta Trop. 2016;161:18-25.
7. Obi R. Yellow fever hemorrhagic disease is just around the corner, 2016. Available at: http://theleaderassumpta.com/2016/09/10. Accessed on 16 March 2021.
8. World Health Organization. Increased risk of urban yellow fever outbreaks in Africa, 2021. Available at: http://www.who.int/csr/disease/yellowfev/urbanoutbreaks/en/. Accessed on 05 October 2021.
9. Hussein I, Chams N, Chams S, Sayegh S, Badran R, Raad M, et al. Vaccines Through Centuries: Major Cornerstones of Global Health. Front Public Health. 2015;3:269.
10. Centers for Disease Control and Prevention. Vaccination Programs, 2021. Available at: https://www.cdc.gov/vaccines/hcp/aciprecs/general-recs/programs.html. Accessed on 18 March 2021.
11. Breugelmans JG, Lewis RF, Agbenu E, Veit O, Jackson D, Domingo C, et al. Adverse events following yellow fever preventive vaccination campaigns in eight African countries from 2007 to 2010. Vaccine. 2013;31(14):1819-29.
12. World Health Organization. Nigeria, 2021. Available at: https://www.afro.who.int/countrnigeria. Accessed on 18 March 2021.

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